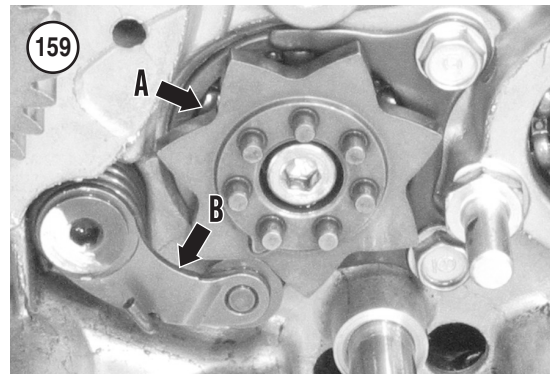


position is indicated when the end slot aligns with the boss (B, **Figure 158**) on the crankcase. When the transmission is in neutral, the countershaft and mainshaft will turn independently of each other (when one shaft is turned, the other shaft does not turn).

2. To check the forward gears (neutral and first through fifth gears), install the shift cam (A, **Figure 159**) and stopper arm (B) as described in *Crankcase Assembly* in this chapter. Turn the mainshaft or countershaft while turning the shifter drum counter-clockwise. The transmission is in gear when the stopper arm roller seats into one of the drum shifter segment ramps. When the transmission is in gear, the countershaft and mainshaft are engaged and will turn together.



3. To check the reverse gear, move the reverse lever (**Figure 160**) down to disengage it from the shift drum and then turn the shift cam (A, **Figure 159**) clockwise. The transmission should shift into reverse.

4. If the transmission does not shift properly into each gear, disassemble the engine and check the transmission and the internal shift mechanism.



ENGINE BREAK-IN

If the piston rings or a new piston were installed, the cylinder was honed or rebored, or major lower end work was performed, break in the engine as if it were new. The performance and service life of the

engine depends greatly on a careful and sensible break-in.

For the first 5-10 hours of operation, use no more than one-third throttle and vary the speed as much as possible within the one-third throttle limit. Avoid prolonged or steady running at one speed as well as hard acceleration.

Table 1 GENERAL ENGINE SPECIFICATIONS

| | |
|-----------------------------|------------------------------|
| Crankshaft type | Two main journals, unit type |
| Engine weight (approximate) | |
| FE/TE | 45 kg (99 lb.) |
| FM/TM | 44 kg (97 lb.) |
| Lubrication system | Wet sump, forced pressure |

Table 2 STARTER DRIVEN GEAR SERVICE SPECIFICATIONS

| | New mm (in.) | Service limit mm (in.) |
|----------------------------------|-----------------|---------------------------|
| Bearing surface outside diameter | — | 45.65 (1.797) |

Table 3 OIL PUMP SERVICE SPECIFICATIONS

| | New mm (in.) | Service limit mm (in.) |
|----------------|-------------------------|---------------------------|
| Body clearance | 0.15-0.22 (0.006-0.009) | 0.25 (0.010) |
| Tip clearance | 0.15 (0.006) | 0.20 (0.008) |
| Side clearance | 0.02-0.09 (0.001-0.004) | 0.12 (0.005) |

Table 4 CRANKSHAFT SERVICE SPECIFICATIONS

| | New mm (in.) | Service limit mm (in.) |
|---|-------------------------------|---------------------------|
| Crankshaft runout | — | 0.05 (0.002) |
| Connecting rod big end radial clearance | 0.006-0.018 (0.0002-0.0007) | 0.05 (0.002) |
| Connecting rod side clearance | 0.05-0.65 (0.002-0.026) | 0.8 (0.03) |
| Connecting rod small end inside diameter | 17.016-17.034 (0.6699-0.6706) | 17.10 (0.673) |

Table 5 ENGINE LOWER END TORQUE SPECIFICATIONS

| | N•m | in.-lb. | ft.-lb. |
|---|-----|---------|---------|
| Cooling fan shroud special bolt | 18 | — | 13 |
| Crankcase bolts | 12 | 106 | — |
| Differential mounting | | | |
| Front bracket bolt | 22 | — | 16 |
| Lower mounting bolt | 44 | — | 33 |
| Upper mounting bolt | 44 | — | 33 |
| Driven pulley bolt | 108 | — | 80 |
| Engine mounting bolts | | | |
| Lower engine mounting bolts/nuts | | | |
| Left and right side | 54 | — | 40 |
| Upper engine hanger bolt | 32 | — | 24 |
| Upper engine hanger bracket bolts | 54 | — | 40 |
| Gear position switch mounting bolts | 12 | 106 | — |
| Gearshift cam bolt | 23 | — | 17 |
| Gearshift stopper pin | 22 | — | 16 |
| Ignition pulse generator mounting bolts | 6 | 53 | — |
| Oil drain plug | 25 | — | 18 |
| Oil filter cover flange bolt | 10 | 88 | — |
| One-way clutch mounting bolts | 23 | — | 17 |
| Rear crankcase cover bolts | 12 | 106 | — |
| Skid plate mounting bolts | 32 | — | 24 |
| Stator mounting bolts | 10 | 88 | — |
| Stopper arm bolt | 12 | 106 | — |

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